TITLE

BINARY VIRAL EXPRESSION SYSTEM IN PLANTS

ABSTRACT OF THE DISCLOSURE

This invention relates to a plant transgene expression system. It is comprised of two chromosomally-integrated components that are individually heritable. One component is an inactive replicon, which contains *cis*-acting viral sequences required for replication and is unable to replicate episomally. The other component is a chimeric transactivating gene comprising a regulated promoter operably-linked to the coding region for a protein that can transactivate replicon replication. Regulated expression of the transactivation protein in plant cells also containing the inactive replicon will trigger the release of free replicon from the integrated inactive replicon and allow its episomal replication. The episomal system is useful for the regulated expression of foreign genes through gene amplification in plant tissue. Tissue-specific expression is controlled by the choice of promoter controlling the transcription of the transactivation gene.

This invention also relates to a second plant transgene expression system. This system has two chromosomally-integrated components that are individually heritable. One component is an inactive transgene, which contains site-specific sequences and is unable to be expressed. The other component is a chimeric transactivating site-specific recombinase under the control of a regulated promoter. Regulated expression of the site-specific recombinase protein in plant cells also containing the inactive transgene will activate the transgene through site-specific recombination. The expression system is useful for the regulated expression of foreign genes in plant tissue. Regulated expression is controlled by the choice of promoter controlling the transcription of the recombinase gene.

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